Subdivision Plan Design / Review Checklist

Subdivision Name: _____

Date: _____ Reviewed By: _____

LEGEND: ✓ - OK / Satisfactory
✕ - Not Addressed
N/A - Not Applicable

Engineer Response / Sheet No.

Subdivision Plan Format

Subdivision Development: Plans for roads, drainage and erosion control shall be submitted to the office of the Environmental Engineer for all proposed projects where roads are to be taken into the State Secondary System (9 sets, to include sewer and water line profiles) All plans must be folded and bundled accordingly. Include separate agency transmittals for EE(2), VDOT(2), CDOU(2), CDOT, FIRE, and PLANNING. Plans will not be processed nor forwarded unless 2 copies of approved tentative plan and signed tentative conditions letter are included in the submittal package for VDOT/EE. If sectioning is desired, each section must be submitted as a separate plan package and bundled accordingly.

Program Administration: The fee must accompany the initial plans submission and is processed by the front counter.

The following information (where applicable) is to be provided or considered on all plans submitted for review.

Cover Sheet shall contain the following information:

____ 1. Subdivision name and section designation
____ 2. Magisterial District followed by "of Chesterfield County, Virginia"
____ 3. Zoning case number and Board approval date (provide copy of BOS minutes or CPC approval letter)
____ 4. Tentative case number and tentative approval date (provide copy)
____ 5. Name of Developer/Owner, Walkin Address, Telephone Number
____ 6. Date
____ 7. Engineer or Surveyor, Address, signed certification stamp (insofar as allowed by State regulation laws), Telephone number
____ 8. Vicinity Sketch showing existing road names.
____ 9. General construction notes
____ 10. Provide note stating how CBPA compliance has been achieved for the project
____ 11. Sheet index

____ 12. Property Tax ID/GPIN

Construction Plan Sheets shall contain the following information:

____ 1. Indicate all proposed and existing rights-of-way widths, all lot lines, all lots with numbers, easements, all street names and existing State route numbers. Stipple all areas proposed to be paved.

____ 2. Indicate centerline stations at 100' intervals and at all other strategic points, i.e. drainage structuring, utilities, etc. and intersection of streets.

____ 3. When proposed and existing streets intersect, indicate existing conditions for 600 feet in each direction. This is to include width of pavement, right of way, location and direction of roadside drainage, any culverts to include inverts, utilities, etc.

____ 4. Indicate proposed driveway entrance culvert size (10-year), length, and location.

____ 5. Indicate all proposed and existing storm sewers, culverts and appurtenances, identify by type, size, length, material, inverts.

_____6. Every inlet and segment of storm sewer shall be assigned a structure number. A drainage structure description shall be provided as applicable on each respective plan sheet.

____ a. Indicate inlet and outlet elevations of all appurtenances including slot length.

_____7. Indicate with arrows, the direction of flow in all gutters, storm sewers, ditches, subsurface drains, streams, minimum finished floors, etc.

_____8. Indicate all existing and proposed ditches and streams and any relocations showing longitudinal slope and furnish detailed typical section showing type of stabilization to be provided and maximum and minimum vertical depth.

_____9. Indicate direction of North on each sheet.

____ 10. Indicate location and description of all benchmarks and their elevation referenced to mean sea level. At least one (1) benchmark must be shown within the limits of the subdivision section.

____ 11. Indicate location of any County control monuments within vicinity.

____ 12. Plans shall be to a scale of 1"=50' or 1"=100' for lots greater than 1 acre, unless otherwise approved.

____ 13. Any notes that may be necessary to explain the intent and purposes of the plans.

____ 14. Indicate the location and width of all proposed and existing sidewalks and walkways.

____ 15. Show/label all USACOE wetlands, WOUS, 100-yr F/P, BW, RPA's.

____ 16. Dimension 25' building setback off the 100-yr F/P, 100-yr BW, wetlands/WOUS and RPA, whichever is most restrictive.

____ 17. Show Dimensioned Building Envelopes (DBE) where critical, as determined by EE.

____ 18. Indicate proposed and existing lakes and ponds onsite and in vicinity of projects. (NOTE: Separate detailed plans are to be submitted for all such structures).

____ 19. Adjacent property owners name, GPIN's and lot lines must be shown.

____ 20. Easements must be stationed in such a manner as to coordinate with profiles.

____ 21. Match lines must be shown with any overlap distinguished by dotting such overlap.

____ 22. Cut and fill construction limits must be shown, unless otherwise approved.

ADDITIONAL COMMENTS: _____

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Profile Sheet(s) shall contain the following information:

____ 1. Existing centerline profiles and stations must be shown on all proposed streets, storm sewers, stream relocations, outfall ditches (to existing streams, and on drainage ditches to include location and elevation of utility crossings).

____ 2. Offset profiles of existing ground should be shown to the right and left of centerline at the right of way line – include legend.

____ 3. The finished grade line of all streets must show and include:

- ____ a. Percent of grade
- ____ b. Stations and Elevations at the low point and at all points of intersections.

____ 4. Stations shown on profile must agree with stations shown on plan. Stations must progress in the same direction on both plan and profile.

____ 5. Show existing/proposed profiles 300 feet beyond construction limits of roads that stub into adjacent properties or future sections.

____ 6. Show proposed culvert or storm sewer crossing at the proper location and grade, as well as sanitary sewer and water crossings.

____ 7. Each storm sewer system should be shown in its entirety to include, as a minimum, the following information: (alternate identify Structure number)

- ____ a. Percent of grade and length
- ____ b. Size and material
- ____ c. Show catch basins, inlets, etc. with proposed elevation for tops and inverts.
- ____ d. Show existing and proposed ground surface over centerline of system.
- ____ e. Existing utilities passing perpendicular to the system or sharing a common easement (to include outer elevation)

____ 8. Open channels must include, as a minimum, the following:

- ____ a. Percent of grade

____ b. Centerline profile

____ c. Existing ground profiles at centerline and easement edge (as deemed necessary).

____ d. Typical section showing 10-year design depth, side slopes, lining, and pertinent hydraulic data.

ADDITIONAL COMMENTS: _____

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Detail Sheet(s) shall contain the following information:

____ 1. Show details of all proposed structures for which there is no standard drawing or modification of standards drawn to scale. Examples would be special drop inlets (DI-6), channel cross-sections, typical road cross-sections, sidewalk sections and erosion control devices, etc.

____ 2. If a VDOT standard is modified, detail must be shown with all applicable dimensions drawn to scale.

____ 3. List all construction notes necessary to complete the work.

____ 4. Number assigned to structure shall be shown with detail.

General Topographic (Drainage Areas & Erosion Control) Sheet(s) shall contain the following information:

____ 1. The drainage area plan shall not be incorporated into the EC plan but be a separate sheet.

____ 2. Show existing contours (maximum of five foot interval) to mean sea level datum (or lesser interval where deemed necessary by County).

____ 3. Show proposed and existing road right of way with road lanes, layout, property and lot lines; Residential and commercial building, parking lots, other physical features etc. (1"=50' or 100')

____ 4. Indicate schematically, all proposed and existing drainage structures, channels, etc. showing structure numbers.

____ 5. Indicate limits of drainage areas and the acreage of each area. When the off-site drainage area becomes larger than one hundred (100) acres, the limits of the area may be shown on a larger scale map (maximum 1"=2000') with a larger contour interval (maximum 10'). All drainage area maps must be scaled maps and completely

contoured with contour elevation and part of the actual plan assembly. (not submitted separately)

____ 6. Indicate limits of computed 100-yr flood plains, wetlands, RPA's/RCMA's and identify.

____ 7. Use arrows to indicate direction of flow on all roads, ditches, pipes, etc.

____ 8. Show on contour map, the stations and lot numbers.

____ 9. The E&SC plans shall be a minimum of 2 phases.

Miscellaneous Submittal Requirements

____ 1. One additional overall project section sheet showing vehicle per day count, and streetlight location, as per the streetlight policy, must accompany the initial submission. The streetlight plan is reviewed by the chief of inspections.

Subdivision Plan Design

Design Requirements

____ 1. Received VDOT, CDOT, CDOU, FIRE, and Planning (if applicable) approvals prior to EE plan approval.

____ 2. Have zoning conditions been satisfactorily addressed in construction plans.

____ 3. Have tentative conditions been satisfactorily addressed in the construction plans.

____ a. Does the construction plan road/lot layout and RPA limits match the approved tentative plan.

____ 4. Has site inspection been made to "field truth" existing conditions as shown in the construction plans.

____ a. Do road beds or other features exist which should be graded/restored to surrounding ground elevation.

____ 1. Earmark lots with NBP

____ 5. Are natural drainageways (unencumbered by wetlands/WOUS) adequate conveyance systems which should have 25' Building Setback Limit (BSL) dimensioned

____ a. Specify that they are to remain in a natural state undisturbed.

_____ 6. Does existing drainage flow pattern conflict with building envelope

____ a. Has a contoured lot grading and drainage plan been provided.

____ b. Earmark lot with NBP

____ c. Dimension a Building Envelope 25' off Centerline of Drainageway.

____ 7. Has an approvable road design for sag conditions per VDOT Standards been provided a minimum 300' into adjacent property/future sections in plan and profile.

____ a. VDOT Slope and Drainage easements and TCE's for fill slopes outside ROW.

____ 8. Are easements and/or improvements necessary to guarantee upstream offsite areas a permanent conveyance thru onsite development.

____ 9. Are proposed road fill slopes beyond the limits of ROW enclosed in VDOT S/D easements.

____a. Minimum 10' TCE's within lots adjacent to future road extensions.

____10. Does lot drainage cross more than 2 lots.

____ a. Specify grass side yard swales (5:1 SS @ 12" depth) minimum 1% slope including a profile or spot flow line elevations.

____ b. Dimension side yard swale 5' off the property line on the upstream side of downstream lot.

____ c. Grass yard swales across multiple lots to be enclosed in minimum 16' drainage easement to ensure permanent conveyance.

____ d. Earmark lots requiring grass side yard swales with NBP (No Building Permit)

____ e. Provide a 6" vertical opening with a 2' concrete gutter in the back of DI's within the ROW where available to intercept side yard swales.

____ 11. To assure positive lot drainage, do Minimum Crawl Space Elevations (MCSE) need to be specified a minimum 1' above original ground.

____ a. Provide typical MCSE detail.

___ 12. Do the 100-yr calculations submitted show that the backwater elevation is at or below the 100-yr floodplain upstream/offsite.

____ a. If the proposed 100-yr elevation is higher, a 100-yr backwater easement or revised floodplain limits must be recorded.

____ 13. Does proposed grading activity establish limits of 100-yr floodplain or backwater.

____ a. Has filling in the 100-yr FP to achieve a building envelope been proposed – it is not allowed.

____ b. Has the 100-yr FP limits been shown to verify that proposed filling is only to enlarge building envelopes, by separate submittal.

____ c. Limits must be certified by a licensed professional prior to the release of the Building Permit and so stated in the plans.

___ 14. Could proposed building envelopes be impacted by a dam failure during the 100-yr storm event.

____ a. Specify MFF(DF) elevation 1' above dam failure.

____ b. Show Dimensioned Building Envelope (DBE) outside dam failure limits.

ADDITIONAL COMMENTS: _____

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_____

Hydrology

____ 1. Rational Method limited to maximum 200 acres

- ____ a. 1.25 Saturation factor used for 100-yr storm calculations.
- ____ b. OLF length does not exceed 200 feet
- ____ c. flow path shown/labeled

____ 2. TR-55 method used for areas exceeding 200 acres

____ 3. Are runoff coefficients, CN's, T_c's and drainage areas acceptable.

____ 4. Onsite DA Map on 50' or 100' scale for lots greater than 1 acre, unless otherwise approved.

- ____ a. Numeric contour elevations clearly shown
- ____ b. Contours clearly establish ridge lines

ADDITIONAL COMMENTS: _____

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Hydraulics

____ 1. Culverts, storm sewer and open channels designed to minimum 10 year criteria

- ____ a. 10-yr flow less than pipe capacity.
- ____ b. 10 yr HW/D < 1 for private entrance culverts within ROW
- ____ c. All calculations submitted on standard VDOT forms or other acceptable documentation.
- ____ d. All pipes are Class III RCP at a minimum.
- ____ e. Dimensioned channel section with 10-yr lining depth, side slopes, bottom width specified/shown in plan/profile
- ____ f. Open channel slopes < 0.75% shall be paved.
- ____ g. Open channel/Storm sewer minimum slope 0.2%
- ____ h. Manhole steps required in structures 4 feet and greater in depth
- ____ i. EC-1 or OP specified at beginning and ends of storm sewer/culverts
- ____ j. IS-1 restricted to pipe diameters < 30"
- ____ k. Pipe diameter $\geq$ 30" shall qualify for 50% reduction in junction losses only if precast manhole tee's and elbows specified
- ____ l. First roadside ditch culvert adjacent to drainage break may be 12" RCP.

____ 2. Specify private/secondary RCP entrance culvert diameters and lengths on each lot.

- ____ a. Minimum 20' length for private/secondary entrance culverts
- ____ b. Minimum 100-year design

____ 3. Open Channel

____ a. Rip rap channels not acceptable in front or beside single-family homes unless further than100' from homes or otherwise approved.

____ b. Rip rap channels can be used to rear of lots if no closer than 75' to homes.

____ c. Where paved channels are steeper than 15%, anchor lugs are required every 10', C' – C'

____ d. 8" vertical wall (freeboard) required along outside radius of paved ditches.

____ e. Maximum permissible flow velocity of 3.5 fps for grass ditches.

____ f. Open channel depths less than 3', otherwise shall be piped.

____ 4. Rip Rap lining a minimum 24" thickness with geotextile fabric underlayment.

____ 5. Has 3 inlet configuration or CG-6 with concrete driveway aprons specified on cul-de-sac's intercepting upstream road runoff.

____ 6. Maximum 18" RCP private entrance culvert within cul-de-sac bulb.

____ a. Otherwise pickup ditch flow at reverse curve of cul-de-sac by culvert

____ 7. Culverts, storm sewer, and open channels analyzed for 100-yr property protection

____ a. Are 100 yr contained within easements/ROW or 100 yr overflow limits shown

____ b. Are 100 yr backwater limits/elevations shown

____ c. Do single point access roads and secondary entrance culverts pass the 100 yr storm without overtopping the road sag. Maximum 6" overtopping with second point access.

____ d. Are 100 yr Floodplain limits shown along natural drainageways.

____ e. Are 100 yr Floodplain cross sections with elevations shown along floodplain limits

____ f. Are MFF elevations specified at lots 1 foot above 100 yr floodplain (FP) or backwater (BW) or road sag (SAG) elevations, whichever is greater.

____ g. Where flatter topography exists, 100 yr floodplain limits must be field verified by licensed professional and so stated in the plans.

____ 8. Headwalls required for pipes 30" or larger, or multiple lines or when slopes exceed 15%.

____ 9. DI-6 yard inlets required in county easements - horizontal grate/inlets not acceptable.

____ a. Specified minimum 2' concrete gutters

____ b. Specified slot opening locations (N,E,W,S)

____ c. DI-6 detail included in construction plan details

ADDITIONAL COMMENTS: _____

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Chesapeake Bay Preservation Act

____ 1. Confirm Worksheet A (pollutant removal requirements) calculations approved.

____ 2. Have BMP design calculations been submitted.

____ a. Volumes where depths exceed 8' (entire water column) excluded from water quality volume.

____ 3. Provide separate BMP grading plan on 1" = 20' scale.

____ a. Specify the normal pool and 10/100 year water surface elevations (WSE)

____ b. Provide minimum 3:1 length to width ratio per E&SC Manual.

____ c. Provide scaled centerline profile of the pond and embankment with applicable elevations, slopes, widths, etc.

____ d. Provide enlarged scaled principal/emergency spillway detail with applicable elevations, dimensions, material, etc.

____ e. Does principal concrete spillway provide 10-yr capacity.

____ f. Have sediment forebay(s) been provided at major inflow points.

____ 1. Forebay dimensions should not exceed 20' due to cleanout limitations.

____ g. Emergency spillway may be grass or riprap lined in natural ground or paved in fill to 100-yr depth.

____ h. Does wet pond range in depth from 3' to 8'.

____ i. Top of dam shall provide minimum 1' freeboard above 100 year WSE.

____ j. Top of dam width minimum 8' and slopes 3:1 or flatter for maintenance.

____ k. Does dam embankment section specify an impermeable clay core keyed into impermeable subgrade.

____ l. Provide 12" valve/12" pipe with elbow off the bottom to lower pond for maintenance.

____ m. O-ring RCP pipe shall be used for barrels/risers.

____ n. Inflow pipes shall be partially submerged to the spring line (half the pipe diameter).

____ o. Riser and pipe barrels no smaller than 15".

____ p. Plastic Trash rack specified and dimensioned detail provided.

____ 4. Has SWM/BMP easement been shown enclosing entire facility and embankment/outfall.

____ a. Established 25’ off 100-yr WSE or toe of dam.

____ b. Provided minimum 20’ wide access easement.

____ c. Provided minimum 12’ wide, 6” base stone access road design & detail.

____ 5. SWM/BMP safety measures required for slopes steeper than 6:1 20’ from the shoreline.

____ a. When concrete weir depth exceeds 3’, a pedestrian crossing structure shall be constructed across the weir.

____ b. Basin 4’ or less in depth and $\leq$ 1 acre surface area, safety bench required.

____ c. Basin greater than 4’ in depth or more than 1 acre surface area, both safety and aquatic benches required.

____ d. Is safety bench 10’ wide at 10:1 slope

____ e. Is aquatic bench 6’ wide at 6:1 slope

____ f. Fencing around basin alternative to safety/aquatic benches- minimum height of fence 6’.

____ 6. Has 50’ vegetative perimeter yard setback measured from 100-yr WSE or the toe of dam been shown/dimensioned. (must be within limits of project)

____ 7. Dimension/Label the “100’ RPA Buffer Area” landward of wetlands contiguous to perennial stream to establish limits of the RPA.

____ 8. RPA signage located at every other lot along RPA and include RPA sign detail.

____ 9. Is RPA buffer area restoration required, If so please include detail.

____ 10. Are minor/major Water Quality Impact Assessments required.

ADDITIONAL COMMENTS: _____

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Erosion Control

____ 1. Have the construction narratives been divided into 2 phases and shown on the EC plan, not elsewhere.

____ 2. Do the EC phase 1 and 2 plans ghost such features as ROW, property lines, centerline stationing, street names, lot numbers such that the EC measures and related activity “standout” in the plans.

____ 3. Have the standard EC notes from the handbook been included on the EC detail sheet.

____ 4. Are details with applicable information provided on the detail sheet for every EC measure specified.

____ 5. Has a temporary silt trap schedule been provided on the applicable EC plan sheet with volumes and dimensions (length, width, depth, and side slopes).

____ 6. Do EC plans show drainage area limits/acreage directed to temporary sediment traps/basins.

____ 7. Has a commentary been provided that addresses the sensitive areas (RPA's, wetlands, steep slopes, etc.) and erodible soil types.

____ 8. Does the phase 1 EC narrative specify that the county inspector and CRLD must meet to inspect EC measures before proceeding to phase 2.

____ 9. Have the clearing limits been restricted to only that necessary to install the phase 1 EC measures-SF, DD, ST's, SB's, and stockpile area.

____10. Does the phase 1 plan specify that pipe barrel/riser must be onsite before issuance of Land Disturbance Permit (LDP).

____11. Does the phase 1 plan specify that the safety fence and flagging along the RPA/wetlands/sensitive areas must be visible before the issuance of the LDP.

____12. Do the EC plans for phase 1 provide a 1' contoured grading plan for the construction of the sediment basin(s).

____ a. Provide trash rack detail with dimensions.

____ b. Provide Sediment Basin dam section with elevations and dimensions.

____ c. Provide emergency spillway detail with dimensions.

____ d. Provide reclamation grading plan for removal of the sediment basin.

____13. Are temporary slope drains specified to convey sediment ladened runoff from the road templates over the fill slopes exceeding 5' in height.

____14. Does the phase 2 EC narrative state that additional EC measures may be required by EE if warranted by field conditions.

____15. Does the phase 2 EC narrative state that no temporary silt trap's or sediment basins shall be removed until approved by EE.

____16. Has itemized Cost Estimate been submitted for approval of bond amount.

____17. Have MS-19 calculations with field taken sections (H=V) been submitted for onsite/offsite receiving facilities.

____ a. 2-yr analysis for natural

____ b. 10-yr analysis for manmade

____ c. Does section location satisfy 1% rule.

____ d. Are section locations shown/labeled.

____18. Prior to issuance of Land Disturbance Permit:

____ a. Construction plans approved by Environmental Engineering.

____ b. Received documentation from COE/DEQ.

____ c. Received processed VSMP registration and fee form.

____ d. Provided DB-PG of all offsite easements.

____ e. If applicable, received processed VDOT land use permit applications.

____ f. EC bond posted.

____ g. Received signed notification from applicable adjacent owners unless otherwise required.

ADDITIONAL REVIEW COMMENTS: _____